ORIGINAL ARTICLES

Scientific and General

RHEUMATIC FEVER: ITS INCIDENCE IN THE SOUTHWESTERN STATES*

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THE pronouncement has been made frequently that rheumatic fever is most severe and frequent in temperate and cold climates, that "wherever the weather is cold, wet, and changeable, rheumatic fever thrives." In other words, the disease has been said to flourish in those climates in which streptococcic infections commonly thrive. In my discussion, I shall attempt to offer an opinion based on definite clinical evidence that rheumatic fever occurs, with greater frequency than has been realized by reporters in the cardiac field, in tropical and subtropical climates.

Rheumatic fever, with heart disease, is far more frequent than any other cardiac ailment in childhood. It is almost the only form of chronic heart disease occurring in the age group under fourteen, with the exception of congenital heart disease. The etiology of rheumatic fever has been controversial. It is now fairly well conceded that a definite rôle is played in its causation by repeated infections of the beta hemolytic streptococcic group.

The seriousness of rheumatic fever makes it imperative for pediatricians, cardiologists, and educators to study and learn more about the occurrence, symptoms and prevention of the disease. Too little is now known about the incidence because, in most States, the disease is not reportable; and even in those States where it is supposedly done, reports are not made. In discussing this matter recently with the health officers of the southern counties of California, all of them confirmed the usual contention that rheumatic fever does not exist in Southern California.

The manifestations of rheumatic fever are systemic and may be associated with acute carditis, acute polyarthritis, chorea, myalgia, and insidious carditis. The disabling nature of the disease should demand from the medical profession an early diagnosis so that the appropriate treatment may be instituted and thereby morbidity and mortality reduced. The often-quoted figures of Jones,[1] from a ten-year study of 1,000 cases of rheumatic fever, indicate that only one-fourth escape the ravages of the disease, while another one-fourth die. This leaves one-half with residual cardiac damage; of these, one-sixth are totally incapacitated and one-sixth are for all practical purposes completely well, while two-thirds of the remainder are permanent cardiac cripples. There is no exact information which would permit evaluation of what early diagnosis and essential treatment would do in such cases.

Deaths from heart disease under forty years are almost entirely due to rheumatic heart disease. Therefore, we can assume that rheumatic fever contracted in childhood is reflected in the cardiac deaths up to forty years, which comprise 25 per cent of all cardiac deaths. These estimates are sufficient to prove that heart disease in childhood, which is largely rheumatic fever, constitutes an overwhelming public health program. Among school children only, heart disease is the fourth cause of death in the United States. Various estimates place the number of cardiacs in the United States at from 2,000,000 to 3,000,000, and about fifteen out of each 1,000 school children have some form of heart disease. In fifty years the incidence of tuberculosis has declined 50 per cent. The incidence of heart disease has increased 45 per cent. This contrasting picture is the result of better and more widespread dissemination of knowledge regarding tuberculosis, its diagnosis and treatment. Studies of the incidence of heart disease will serve notice to everyone concerned that we have a challenge to reduce the irreparable loss of hours due to the disease, especially in the months of emergency that face us.

AUTHOR'S SERIES

For the purpose implied in the title of this discussion, I have included a group of 112 proved cases of rheumatic fever studied in private practice, and have analyzed the information and reports on eighty-three additional cases admitted to one of the private hospitals in San Diego, California. These patients were all children, ranging in age from three to fifteen years. They were all natives of Southern California or southwestern Arizona, and had not resided outside that area at any time. The purpose of the study was to determine the type, severity and season of onset, and the extent of cardiac damage in these patients. In all of these cases careful histories were taken, with special reference to hereditary, economic and environmental factors and infections, their nature and extent. Examination included thorough physical inspection, together with electrocardiographic studies, fluoroscopic and x-ray examinations of heart and lungs, blood counts and sedimentation rates. The diagnosis was based on the composite picture of these findings.

In this series of 112 cases in private practice, 70 were females and 42 males, showing the usual predominance of females reported by other observers. The onset of the disease in 55 instances was in the spring; summer in 22; fall and winter in 45. The youngest patient was two and one-half years old and the oldest, fifteen years old. The largest number of cases occurred in the age group between six and twelve years. The symptoms varied from those starting with acute polyarthritis, with acute carditis and high fever from the beginning, to the mild, insidious case initiated by joint pains and low-grade fever, with cardiac manifestations and findings later. The course of some was short, with normal heart findings after the attack. In most instances there was evidence of permanent

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valvular heart disease. The average case showed the signs and symptoms for weeks and months. The fever persisted, the appetite remained poor and the color pale, pain in muscles and joints remained, and evidence of cardiac failure occurred at intervals. After variable periods symptoms improved, and appetite, color and weight were regained. The heart findings remained, however, and recurrent, acute exacerbations were evidenced in most cases, with further heart damage resulting. In this series of cases, chorea and rheumatic nodules were rare. Occasional erythemas and abdominal types of onset were found.

REPORT OF CASES

CASE 1.—The patient was a female, born on January 12, 1939, a native of Southern California and had always resided in that area. She was the daughter of a physician. There was no family history of rheumatism. The past history revealed many attacks of otitis media and tonsillitis. Examination in January, 1940, showed a pale, underweight female of one year. There was a history of nervousness, irritability, lack of appetite and repeated respiratory infections. There were no joint or muscle pains. Physical examination was negative except for hypertrophied and infected tonsils, underweight, and obvious anemia. The heart was normal. Blood count showed 3½ million red blood cells and a hemoglobin of 72 per cent. Blood sedimentation rate was normal. During the spring of 1942, recurrent colds, sore throats, and otitis media occurred. She was fairly well during the summer of 1942. She had a tonsillectomy and adenoidectomy in August, 1942, from which a good postoperative recovery was made. Her respiratory infections began again in October, in spite of an ideal dietetic management with high vitamin intake, sun baths, and respiratory vaccines. Up to January, 1943, there were no indications of rheumatic fever. At that time there was a sudden onset of severe muscle and joint pains, associated with temperature ranging up to 104 degrees Fahrenheit, with almost immediate cardiac involvement, consisting of tachycardia, cardiac enlargement and a valvular lesion, mitral in type. The first acute attack persisted about two months. The diagnosis was amply proved by the symptoms, course, and obvious carditis. Laboratory findings showed the usual secondary anemia and a markedly increased sedimentation rate, up to 100. Here we have a typical case of acute rheumatic fever developing in a subtropical climate, where economic and housing conditions were ideal, with the consequent development of a chronic, disabling heart disease.

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CASE 2.—The patient was a male, ten years of age, born in the Imperial Valley, California, where he had always lived. There was no hereditary factor of rheumatic fever. The patient was first seen in May, 1940. The only pertinent point in the past history was the occurrence of repeated colds and respiratory infections for several years prior to the examination. A tonsillectomy and an adenoidectomy had been done at two years of age. In March, 1940, he had a sudden onset of severe muscle and joint pains, with temperature ranging from 100 to 103 degrees Fahrenheit, loss of weight, sweating, nosebleeds, and lack of appetite were associated. Shortness of breath, pounding of the heart, and a slight edema of the ankles developed shortly. No record of any heart findings or electrocardiographic tracings were made by the attending physician at the time. Physical examination in May, 1940, showed a pale, underweight, male child of ten years. The positive physical findings were largely cardiac, consisting of definite evidence of cardiac enlargement by fluoroscopic and physical examination and a definite harsh systolic murmur with signs of partial heart-block. The electrocardiogram showed a ventricular rate of 65 to 70, irregular. The P-R interval varied from 0.16 seconds to almost simultaneous occurrence with the QRS wave, and at times there was no P wave preceding the QRS complex. The blood picture showed secondary anemia, and the sedimentation rate was 36. Observations at regular intervals have shown a complete clearing of the heart-block. The cardiac enlargement has persisted, and a permanent mitral heart lesion has developed.

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CASE 3.—The patient was a female, seven years of age. She had been born in the Imperial Valley and had lived there for the seven years of her life. The family history and environmental history were negative. The past history was negative, except for severe measles at two years of age and mild scarlet fever at three years. A tonsillectomy had been performed at three and one-half years because of repeated attacks of tonsillitis, occurring after the scarlet fever. She was first seen in March, 1941. About one month previously she had had a slow, insidious onset of recurrent muscle and joint pains, with fever ranging from 99 to 101 degrees Fahrenheit. She complained of fatigue, did not eat well, slept poorly, and lost some weight. Examination showed a pale, somewhat underweight female child of seven years. The positive findings were mainly cardiac. The heart was slightly enlarged, with definite evidence of a mitral *lesion*; tachycardia and a slight elevation of blood pressure were associated. Electrocardiograms confirmed the physical findings. Low-grade fever was present, as were definite secondary anemia and an increased sedimentation rate.

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CASE 4.—The patient was a male, fourteen years old. Born in Yuma, Arizona, he had lived there for four years and in San Diego for the remainder of his fourteen years. The family hereditary story showed a history of rheumatic fever. The father had a rheumatic heart disease, and a brother, four years younger than the patient, had a similar condition. He had had measles, pertussis and scarlet fever, and at the age of eight a tonsillectomy had been performed. He had had psoriasis for ten years. In the spring of 1941, he fell and sustained an injury to his right knee joint, for which the attending physician applied a cast for several weeks. After the removal of the cast, it was noticed that not only was the right knee swollen and tender, but that the left knee and the smaller joints of the fingers and toes began to enlarge and become very tender. Low-grade fever and general malaise were associated. I first saw him in October, 1941, at which time he was completely bedridden, with severe, generalized polyarthritis. His heart was enlarged, with a rapid rate. Associated was the finding of a mitral lesion. These observations were confirmed by his electrocardiogram. The sedimentation rate was increased, and there was marked albuminuria and secondary anemia. Since that time he has run a low temperature, and there have been periods of regression and exacerbation of the joint condition. His heart is permanently damaged.

COMMENT

Similar case histories could be repeated for all the others studied. The rheumatic fever ranged from mild to severe, as has been observed in other climates. Complete analysis of these cases, together with a summation of the findings in the additional eighty-three records checked at a private hospital in Southern California, enables me to offer several comments regarding the incidence and other characteristics of rheumatic fever in the southwestern United States as follows:

1. Acute rheumatic fever and rheumatic carditis are found far more frequently in this area than has been claimed by most observers. The incidence can be charted more accurately if the law requiring reportability of the disease is systematically observed by all of us.

2. The severity of the cardiac complications is approximately as great as in colder and more severe climates.

3. Poor housing and economic conditions do not seem to be contributory factors to the disease in this area.

4. Repeated respiratory and throat infections of a streptococcic type seem to precede the actual onset of the acute attack.

5. The removal of tonsils and adenoids does not seem to alter the incidence of the disease nor does removal act as a prophylaxis.

I trust that stimulation to further studies, especially in children who, after all, are the cardiac problems of later years, may be induced by this and other efforts of a similar nature.

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REFERENCE

1. Jones, T. Duckett: The Natural History of Rheumatic Fever—Ten-Year Study of One Thousand Cases. Presented at the annual symposium of the San Francisco Heart Committee, November 6, 1942.

THE DISPOSITION OF SUBSTANDARD MILITARY PERSONNEL*

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HOW to eliminate physically and mentally handicapped soldiers and thereby procure and maintain a dynamic army has been a serious military problem since earliest times.

The disposition of such substandard military personnel was a matter of concern at least as far back as the time of David. Some years after his epic struggle with Goliath, David's home town was burned (I Samuel, Chapter 30), and his two wives, with others, were taken captive and considerable property carried away. "But David pursued, he and four hundred men; for two hundred stayed behind, who were so faint that they could not go over the brook Besor." In other words, about one-third of his six hundred men "were so faint"—or, in our language, so physically or mentally disabled—that they had to be eliminated from the army as unfit.

Exactly how David determined who were so faint and, therefore, incapacitated for his army is not told, but nowadays the job is handled by the doctors. In this era, before men joined the Army, both civilian and Army doctors tried to keep the unfit from becoming soldiers. Many of them were kept out. As proof of that fact, Colonel Leonard G. Rowntree's statistics are presented as given in *The Military Surgeon* of March, 1942.

TABLE 1.—*Selective Service Induction Rejections*

Cause of Rejection	No.	Percentage
Dental defects	188,000	20.9%
Defective eyes	123,000	13.7%
Cardiovascular	96,000	10.6%
Musculo-skeletal	61,000	6.8%
Venereal	57,000	6.3%
Mental and nervous	57,000	6.3%
Hernia	56,000	6.2%
Defects of ears	41,000	4.6%
Defects of feet	36,000	4.0%
Defective lungs	26,000	2.9%
Miscellaneous	159,000	17.7%
	900,000	100.0%
Illiterates	100,000	
Rejected	1,000,000	(50%)
Accepted	1,000,000	(50%)
	2,000,000	(100%)

SELECTIVE SERVICE REJECTIONS

It will be noted that the figures given in Table 1 were compiled at about the beginning of our entrance into this war. Since then standards have been lowered in order to allow men with minor physical defects to function in limited service capacities.

At about the same time, in March, 1942, we studied our series of cases in order to determine what types of diseases were most difficult to detect on the induction examinations. We found that we had 582 cases and of these, 502 were soldiers discharged on a Certificate of Disability, and 36 by "Section VIII" Board procedure. Sixteen were retired for disability after twenty years of enlisted service and twenty-eight officers were retired for various incapacities.

It should be stated that the enclosed facts and opinions are not official. They are my own and they do not necessarily reflect the opinion of the Surgeon General or the War Department.

ON SOLDIERS DISCHARGED FOR DISABILITY

The following chart is an analysis of the causes and the line of duty status of the 502 soldiers who were discharged on Certificate of Disability.

TABLE 2.—*Soldiers Discharged on Certificates of Disability*

	No. of Cases	% of Total C. D. D.'s	Line of Duty YES
Nonorganic diseases of central nervous system	251	50.0%	10 (4.0%)
Orthopedic	81	16.1%	12 (14.8%)
General medical	59	11.8%	3 (5.1%)
Eye, ear, nose and throat	38	7.5%	5 (13.2%)
Organic central nervous system	22	4.4%	1 (4.5%)
Cardio-vascular-renal	20	4.0%	6 (30.0%)
Gastro-intestinal	13	2.6%	1 (7.7%)
Tuberculosis, pulmonary	10	2.0%	4 (40.0%)
Miscellaneous	8	1.6%	0 (0.0%)
TOTALS	502	100.0%	42 (8.3%)

COMMENT

These charts reveal that 50 per cent of the first two million men examined were rejected: 45 per cent for physical or nervous difficulties and 5 per cent for illiteracy. One would expect that those who were selected for the Army would be fine

* Read before the second general meeting at the seventy-second annual session of the California Medical Association, Los Angeles, May 2-3, 1943.
The opinions and assertions contained herein are the private ones of the writer and are not to be used as official or reflecting the view of the War Department or the war service at large.